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Relationship between physical self-concept and health-related physical fitness in Spanish schoolchildren

Daniel Mayorga[a], Jesús Viciana[a]*, Armando Cocca[a]

[a]*Department of Physical Education and Sport, University of Granada, Granda, 18011, Spain*

Abstract

The main purpose of the present study was to analyze the relationship between physical self-concept and health-related physical fitness in Spanish children. A sample of 72 Spanish primary education students (boys, n=39; girls, n=33; aged 10-12) participated in the study. All students were evaluated in the same week during the Physical Education classes. Physical Self-Description Questionnaire and EUROFIT test battery were applied to measure the variables (physical self-concept and physical fitness, respectively). Pearson´s correlation analysis showed that physical self-concept and physical fitness are positively related (r=.55; p<.001). Physical self-concept and health-related physical fitness are positively associated in Spanish children.

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Keywords: Physical Self-Description Questionnaire; Eurofit battery test; Self-perceived; Physical Condition; Physical Education; Childhood.

1. Introduction

Nowadays, health is regarded as the state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (World Health Organization, 1946). Developed countries, out of concern for psychosocial pathologies associated with current aesthetic model, have promoted schoolchildren's health from the physic/psychosocial dual reality (Ministry of Education, 2006).

Physical fitness can be thought of as an integrated measure of most of the body functions involved in the performance of daily physical activity and/or physical exercise, which has been considered an important health-related marker in childhood (Ortega, Ruiz, Castillo & Sjöströsm, 2008a). For example, in childhood higher levels of cardiorespiratory fitness are associated with a healthier cardiovascular profile later in life; muscular strength improvements are negatively associated with changes in overall adiposity, and a healthier body composition is associated with a healthier cardiovascular profile later in life and with a lower risk of death (Ruiz, Castro-Pinero, Artero, Ortega, Sjöström, Suni & Castillo, 2009). Health-related physical fitness refers to those components of

* Corresponding author. Tel.: 0034-958-24-6641; fax: 0034-958-24-43-69.
E-mail address: jviciana@ugr.es.

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fitness that have a relationship with health such as cardiovascular endurance, muscular strength, flexibility, and body composition (American College of Sport Medicine, 2011).

Like adults, children can have mental health disorders such as depression, anxiety or a low self-concept. Childhood has been considered a crucial period of life, since dramatic physiological and psychological changes take place at these ages (Harter, 1999). Physical self-concept is regarded as a multidimensional subdomain of overall self-concept that incorporates different characteristics such as fitness, health, appearance, and physical activity (Marsh, Richards, Johnson, Roche & Tremayne, 1994). For these reasons, physical self-concept has been considered to play a crucial role in health during childhood. Physical self-concept attains great relevance due to its impact on the levels of physical activity (Chan, Au, Chan, Kwan, Yiu & Yeung, 2003; Crocker, Eklund & Kowalski, 2000; Planinsec & Fosnaric, 2005), with its corresponding effects on health (Meredith & Dwyer, 1991), use of leisure, and social relationships (Alfermann & Stoll, 2000).

Several studies with adolescents, adults and elders have found a positive relationship between physical self-concept and health-related physical fitness (Amesberger, Finkenzeller, Würth & Müller, 2011; Annesi & Westcott, 2007; Carraro, Scarpa & Ventura, 2010; Guerin, Marsh & Famose, 2004; Marsh & Redmayne, 1994; Marsh, 1996; Moroe, Thomas, Lagally & Cox, 2010), but the literature focused on children is limited (Greenleaf, Petrie & Martin, 2010; Isler, Asci & Kosar, 2002; Jurimae & Saar, 2003; Marsh, 1993). At present, there are no studies on the relationship between physical self-concept and physical fitness involving Spanish children. In particular, it is important to know how Spanish children perceived their physical selves in relation to their fitness levels, and whether there are differences between girls and boys. Consequently, the aim of the present study was to analyze the relationship between physical self-concept and health-related physical fitness in Spanish children, as well as whether there were differences between girls and boys.

2. Method

2.1. Study design and participants

A quasi-experimental *ex post facto prospective* design (León & Montero, 1993) and a correlational analysis to the variables were applied. Physical Self-Description Questionnaire (PSDQ) (Marsh, 1996) and EUROFIT test battery (Council of Europe Committee for the Development of Sport, 1988) were applied to measure the variables (physical self-concept and physical fitness, respectively). A sample of 72 schoolchildren aged 10 to 12 years (M = 11.10, SD = 0.38 years) participated in this study. The participants were children, both boys (n = 39) and girls (n = 33), from a Primary Education school in the province of Granada (Spain). The children and their parents or legal guardians were fully informed about the nature and purpose of the study. Written consent was obtained from participants' parents or their legal tutors. The Ethic Committee of the University of Granada approved the investigative procedure.

2.2. Instruments

Physical Self-Description Questionnaire. This questionnaire consisted of 70 items that measure nine specific components of the physical self-concept (health, coordination, body fat, activity, sports competence, appearance, strength, flexibility and endurance) and two global components (global physical self-concept and global self-esteem). Its response format is based on a 6-point true/false Likert-type scale (higher scores indicating higher physical self-concept). The items have both positively and negatively worded questions. All negatively worded items (21 in total) are reverse scored and summarized with other scores of the correspondent scale. The PSDQ was translated into Spanish, followed by a back-translation procedure widely described in the literature (Marsh, Marco & Abçý, 2002).

Evaluation of the health-related physical fitness was done by the EUROFIT test battery (Council of Europe Committee for the Development of Sport, 1988). Body composition, flexibility, muscular strength, and cardiovascular endurance were measured. Below you will find the order and a brief description of the protocol of tests.

Body Mass Index. Height and body mass were measured with participants in physical education clothing (shorts and a t-shirt) and barefoot. Height was measured using a stadiometer (Holtain, UK) and body mass was measured using a Seca scale (Hamburg, Germany). Body mass index (BMI) was calculated as weight/height squared (kg/m^2).

Sit-and-reach. This test was used to assess flexibility. The child was seated on the floor with both legs fully extended, shoulder width apart, and feet placed flat against the box. The participant slowly reached forward (without jerking) sliding the hands across the top of the ruler, and they held the final position at least two seconds. A reach distance of 15 cm corresponded with the position of the feet against the box. The best record (in cm) in two attempts was retained.

Standing broad jump. This test was used to evaluate lower-limb explosive strength. The participant stood behind the starting line and was instructed to push off vigorously and jump as far as possible. The participant had to land with the feet together and to stay upright. The distance was measured from the take-off line to the point where the back of the heel nearest to the take-off line lands on the floor. A further attempt was allowed if the participant fell backward or touched the floor with another part of the body. The best record (in cm) in two attempts was retained.

Handgrip strength. This test was used to measure handgrip strength. Handgrip strength of the dominant hand was measured using a digital dynamometer (T.K.K. 5101 Grip-D, Japan). The child was instructed to maintain the standard bipedal position during the entire test with the arm in complete extension and not to touch any part of the body with the dynamometer except the hand being measured. The best result (in kg) in two attempts was retained.

Sit-ups. This test was used to assess abdominal endurance strength. The child lied in the supine position on a mat with his/her knees bent at 90 degrees and his/her feet flat on the floor, held down by the examiner. The hands were placed at the back of the head, fingers interlaced. On hearing "Go!" the student's elbows had to contact the knees and return to the starting position as many times as possible in 30 s. The total number of repetitions completed in 30 s was retained.

Bent arm hang. This test was used to evaluate upper-limb endurance strength. The participant had to maintain a bent arm position while hanging from a bar with hands in a forward grip and at shoulder width. The participant's chin must be above the bar. The subject must hold this position as long as possible without resting her/his chin on the bar. The test ends when the participant's eyes goes below the bar. Total time (in s) was retained.

20-m shuttle run. This test was used to assess cardiovascular endurance. All students ran between two parallel lines 20 m apart, the rhythm marked by a recorded beep. The starting speed was 8.5 km/h; it increased 0.5 km/h every minute. The test ended when the child stopped running due to fatigue or failed to reach the line before the next signal for two consecutive times. The last completed lap (timed in seconds) was retained.

2.3. Procedure

All students were evaluated in the same week during the Physical Education classes. The physical self-concept evaluation was conducted through PSDQ (Marsh, 1996). The participants completed the questionnaires in their usual classroom by two members of the research team. Each participant was asked to compare him or herself on a scale from one to six with other children of the same age in terms of physical activity, motor ability, anthropometric characteristics, as well as other physical attributes. Researchers gave a hard copy of the questionnaire to each student, previously offering a general explanation on how it should be completed. Before the children began to fill it in, the researchers solved everyone's doubts. They were also present to solve all doubts that could arise during its completion.

The average of items scores of each physical self-concept component was calculated for the data analysis. Likewise, the average of the four fitness components (body fat, strength, flexibility, and endurance), nine specific components of the physical self-concept, and all components of the questionnaire was calculated to establish other variable named fitness perception, subtotal, and total, respectively.

Evaluation of the health-related physical fitness was done by the EUROFIT test battery (Council of Europe Committee for the Development of Sport, 1988), validated and standardized by the Council of Europe. Physical fitness tests were administered later in the school gym by the same researchers. Two researchers conducted the evaluation following the standard protocol for each test. Prior to the evaluation, all participants performed a warm-up consisting of five minutes of continuous race of low to moderate intensity.

The best record in each physical fitness test was registered for the data analysis. Furthermore, each objective strength variable (standing broad jump, handgrip strength, sit-ups, and bent arm hand) was transformed by dividing each observed value by the maximum value of this variable. The average of the four transformed variables was used to establish a single variable called general strength index (GSI), with values between 0 and 1 (García-Artero et al., 2007). Likewise, each physical fitness variable (BMI, sit-and-reach, GSI, and 20-m shuttle run) was transformed by dividing each observed value by the maximum value of that variable. Then, BMI variable was transformed by one minus the BMI variable obtained. The average of the four transformed variables was called general physical fitness index (GPFI).

2.4. Statistical Analysis

Descriptive statistics (means and standard deviations) were calculated for each variable. The Student´s t for independent samples was used to study gender and physical fitness level differences. To establish physical fitness groups, previously students were divided according to the values obtained in GPFI: Low Physical Fitness (LPF) < 50^{th} percentile and High Physical Fitness (HPF) ≥ 50^{th} percentile (García-Artero et al., 2007). Pearson's correlation coefficient was used to measure the association between physical self-concept and health-related physical fitness variables. The tests reliability was estimated using intraclass correlation coefficient from two-way ANOVA ($ICC_{3,k}$) (Shrout & Fleiss, 1979). Furthermore, as suggested by Baumgartner and Chung (2001), 95% interval of confidence was calculated. All statistical analyses were performed using the SPSS 15.0 for Windows (SPSS® Inc., Chicago, IL). The statistical significance level was set at $p < .05$.

3. Results

Physical Self-Description Questionnaire had a good internal consistency (median coefficient alpha = .88). Physical fitness test-retest reliability ranged from .86 (.73-.93) to .95 (.91-.98). Descriptive statistics and testing differences between boys and girls are presented in Table 1. The Student´s t for independent samples results showed statistically significant major levels of objective and self-perceived strength and endurance for boys (ps ≤.021). General Physical Fitness Index ($p < .001$), as well as subtotal ($p < .019$) and total values ($p < .045$) of physical self-concept showed gender differences statistically significant in favor of boys. Furthermore, activity and sports competence perceived for boys showed higher values statistically significant than for girls ($p = .002$ and .018, respectively). However, both objective and self-perceived values of body composition and flexibility did not show statistical differences.

Table 2 shows Pearson´s correlation coefficients between physical self-concept and physical fitness variables. The results showed several significant correlations between physical self-concept and physical fitness (| r | = .25-.74). A significant association between objectives and self-perceived measures of body composition (r = -.74), flexibility (r = .38), strength (r = .47), endurance (r = .56), and general fitness (r = .59) was found. However, no significant association between health, appearance and global self-esteem perceived and physical fitness measures was found.

Descriptive statistics and testing differences between high and low physical fitness children are presented in Table 3. The Student´s t for independent samples results showed statistically significant major levels in favor of high physical fitness group (ps ≤.041), except for self-perceived health and appearance where no statistical differences were found.

Table 1. Descriptive statistics and testing differences between boys and girls

Variable	All (n = 72) (M ± SD)	Boys (n = 39) (M ± SD)	Girls (n = 33) (M ± SD)	p
EUROFIT				
Body mass (kg)	43.16 ± 1.47	43.16 ± 11.42	43.15 ± 9.73	.996
Height (cm)	146.64 ± 6.79	146.13 ± 6.74	147.24 ± 6.89	.491
BMI (kg/m^2)	19.94 ± 4.01	20.02 ± 4.11	19.85 ± 3.95	.865
Sit-and-reach (cm)	16.31 ± 6.41	16.46 ± 6.28	16.12 ± 6.65	.826
Standing broad jump (cm)	124.56 ± 23.51	136.41 ± 21.05	110.55 ± 18.07	**<.001**
Handgrip strength (kg)	20.64 ± 4.43	21.74 ± 4.37	19.35 ± 4.20	**.021**
Sit-ups (repetitions)	18.90 ± 4.62	21.08 ± 3.37	16.33 ± 4.62	**<.001**
Bent arm hang (s)	14.47 ± 15.80	18.45 ± 18.62	9.31 ± 9.07	**.010**
GSI	0.55 ± 0.10	0.60 ± 0.09	0.49 ± 0.08	**<.001**
20-m shuttle run (lap)	22.66 ± 13.38	26.31 ± 13.61	18.22 ± 11.83	**.010**
GPFI	0.51 ± 0.13	0.68 ± 0.12	0.57 ± 0.09	**<.001**
PSDQ				
Health	4.97 ± 0.78	5.10 ± 0.76	4.81 ± 0.77	.110
Coordination	4.65 ± 0.91	4.73 ± 1.01	4.56 ± 0.79	.436
Activity	4.37 ± 1.29	4.80 ± 1.06	3.87 ± 1.36	**.002**
Body Fat	4.93 ± 1.24	4.94 ± 1.21	4.92 ± 1.29	.937
Sports Competence	4.48 ± 1.00	4.73 ± 1.03	4.18 ± 0.88	**.018**
Appearance	4.41 ± 1.09	4.38 ± 1.13	4.44 ± 1.06	.805
Strength	4.23 ± 1.19	4.59 ± 1.31	3.80 ± 0.86	**.003**
Flexibility	4.10 ± 1.24	4.17 ± 1.30	4.01 ± 1.18	.592
Endurance	3.95 ± 1.12	4.25 ± 1.08	3.60 ± 1.09	**.015**
Fitness Perception[a]	4.30 ± 0.88	4.49 ± 0.89	4.08 ± 0.82	.051
Subtotal[b]	4.45 ± 0.71	4.63 ± 0.72	4.24 ± 0.64	**.019**
Global Physical Self-Concept	5.24 ± 0.92	5.22 ± 0.91	5.25 ± 0.94	.889
Global Self-Esteem	5.03 ± 0.86	5.06 ± 0.95	5.00 ± 0.76	.765
Total[c]	4.58 ± 0.68	4.73 ± 0.71	4.40 ± 0.60	**.045**

Note. M, media; SD, standard deviation; GSI, General Strength Index; GPFI, General Physical Fitness Index; PSDQ, Physical Self-Description Questionnaire; Fitness Perception[a], the average of body fat, strength, flexibility and endurance components; Subtotal[b], the average of nine specific components of physical self-concept; Total[c], the average of 11 components of physical self-concept.

Table 2. Testing correlation coefficients between physical self-concept and physical fitness

Physical self-concept/ fitness	BMI	Flexibility	Strength[a]	Endurance	Fitness[b]
Health	.05	.08	.16	.01	.09
Coordination	**-.30***	.09	**.36†**	**.43‡**	**.47‡**
Activity	-.10	-.03	**.44‡**	**.40†**	**.40†**
Body Fat	**-.74‡**	-.02	**.33†**	**.40†**	**.54‡**
Sports Competence	-.04	.15	**.54‡**	**.51‡**	**.52‡**
Appearance	-.20	-.04	.04	.11	.09
Strength	.22	.19	**.47‡**	**.27***	**.35†**
Flexibility	-.23	**.38†**	.20	**.37†**	**.34†**
Endurance	-.23	.17	**.45‡**	**.56‡**	**.51‡**
Fitness Perception[c]	**-.34†**	**.25***	**.49‡**	**.54‡**	**.59‡**
Subtotal[d]	**-.28***	.17	**.52‡**	**.54‡**	**.58‡**
Global Physical Self-Concept	**-.34†**	.02	.07	.21	.23
Global Self-Esteem	-.18	.05	.11	.17	.20
Total[e]	**-.30†**	.15	**.46‡**	**.50‡**	**.55‡**

Note. Strength[a], General Strength Index; Fitness[b], General Physical Fitness Index; Fitness Perception[c], the average of body fat, strength, flexibility and endurance components; Subtotal[d], the average of nine specific components of physical self-concept; Total[e], the average of 11 components of physical self-concept.

Pearson´s correlation level of significant*p <.05, †p <.01, ‡p <.001.

Table 3. Testing differences in physical self-concept between high and low physical fitness children

Variable	HPF (n = 36) (M ± SD)	LPF (n = 36) (M ± SD)	p
PSDQ			
Health	5.09 ± 0.71	4.84 ± 0.83	.180
Coordination	5.08 ± 0.74	4.23 ± 0.87	**<.001**
Activity	4.83 ± 1.16	3.92 ± 1.26	**.002**
Body Fat	5.53 ± 0.72	4.32 ± 1.36	**<.001**
Sports Competence	4.87 ± 0.87	4.09 ± 0.98	**.001**
Appearance	4.58 ± 0.94	4.24 ± 1.22	.181
Strength	4.52 ± 1.16	3.94 ± 1.16	**.039**
Flexibility	4.47 ± 1.17	3.72 ± 1.20	**.008**
Endurance	4.44 ± 1.03	3.46 ± 1.00	**<.001**
Fitness Perception[a]	4.74 ± 0.71	3.86 ± 0.82	**<.001**
Subtotal[b]	4.82 ± 0.55	4.08 ± 0.66	**<.001**
Global Physical Self-Concept	5.56 ± 0.64	4.91 ± 1.04	**.002**
Global Self-Esteem	5.24 ± 0.70	4.83 ± 0.96	**.041**
Total[c]	4.93 ± 0.51	4.23 ± 0.65	**<.001**

Note. M, media; SD, standard deviation; HPF, High Physical Fitness group; LPF, Low Physical Fitness group; PSDQ, Physical Self-Description Questionnaire; Fitness Perception[a], the average of body fat, strength, flexibility and endurance components; Subtotal[b], the average of nine specific components of physical self-concept; Total[c], the average of 11 components of physical self-concept.

4. Discussion

In the present study several differences were found between boys and girls in both physical fitness and self-perceived measures. Boys perceived greater strength, endurance, and physical self-concept (subtotal and total values) than girls, as well as their fitness perception was marginally greater. In addition, boys showed higher objective values of strength, endurance and general fitness. However, greater values in general fitness in boys were not related to differences in global physical self-concept and global self-esteem between genders. In this line, Jurimae and Saar (2003) found that boys with a similar age (10-11 years) showed both objective and perceived greater strength and fitness. However, although in the previous study the boys showed greater real endurance, they did not self-perceive more endurance than girls. Similarly to the present study, Carraro et al. (2010) found that 12-to-15-year-old boys showed greater objective and perceived strength and endurance than girls. These differences could be explained by sociological differences between genders such as, for example, the major practice of physical activity between boys (García-Artero et al., 2007; Rizzo, Ruiz, Oja, Veidebaum & Sjöström, 2008).

Boys also showed greater activity and sports competence perception than girls. Unfortunately, the objective children´s physical activity and sports competence was not evaluated so that it cannot be compared with perceived measures. However, several studies have showed how during childhood boys do more physical activity and sport than girls (García-Artero et al., 2007; Rizzo et al., 2008), so consequently they perceive themselves more active and sports competent. In addition, in the present study it was found that a positive association of activity and sports competence with strength, endurance and general fitness was greater in boys than girls. The fact that children's physical fitness has been positively associated with physical activity (Isler et al., 2002; Ortega, Ruiz, Hurtig-Wennlöf & Sjöström, 2008b; Rizzo et al., 2008), it justifies the present findings.

Both children's objective and self-perceived values of body composition and flexibility did not show differences between genders. There is a good association between objective body composition (or flexibility) and self-perceived body fat (or flexibility) among children. Due to the real lack of differences of these physical fitness components between genders, boys and girls did not show differences in their self-perception in these variables. In this line, Jurimae and Saar (2003) found that boys with similar ages showed both objective and perceived greater strength and fitness, but both genders did not show differences in objective and perceived measures of body composition and flexibility. Likewise, Carraro et al. (2010) found that although adolescent females showed greater objective flexibility with the sit-and-reach test, they did not find differences between genders´ perceived flexibility. Children did not show differences in health and appearance between genders. As it will be mentioned later, it seems that health regarded as merely the absence of disease or infirmity and appearance regarded as having a good-looking or a nice face, conceptually could not be related with differences in physical fitness.

It was found that there was an association between objective and self-perceived measures of body composition, flexibility, strength, endurance, and general fitness. In this line, previous studies carried out with adolescents and adults obtained a similar association (Guerin et al., 2004; Marsh & Redmayne, 1994; Marsh, 1996; Monroe et al., 2010). Among children of this age, Jurimae and Saar (2003) found a correlation between objective and self-perceived measures of endurance for both genders, and body composition for girls. However, they did not find any association between objective and self-perceived measures of strength and flexibility for both genders, as well as body composition for boys. Likewise, in Carraro´s et al. (2010) study carried out with adolescents, although there was a significant association in body composition and endurance, no association for flexibility and strength measures was found. The lack of correlation found in other studies against the present study could be due to differences in tests choices in relation with fitness component. Body composition and endurance are two general components of physical fitness, however, strength and flexibility are particular of each region of the body. In addition, due to the results in the present study and the Guerin et al. (2004), Marsh and Redmayne (1994), and Marsh (1996), it seems that children better perceived their body and endurance state than their neuromuscular performance (strength and flexibility).

Likewise, each objective physical fitness measure was associated with fitness perception and physical self-concept (total value), except flexibility with physical self-concept. In this line, studies carried out with children, adolescents and adults showed a relationship between physical fitness and physical self-concept, except with the sit-and-reach (flexibility) values (Carraro et al., 2010; Guerin et al., 2004; Marsh, 1993, 1996; Monroe et al., 2010). Flexibility is an important physical fitness component to avoid postural deviations and pain risk (Erkula, Demirkan, Kilic & Kiter, 2002; Jones, Stratton, Reilly & Unnithan, 2005; Sjölie, 2004), however, nowadays its role of a marker

of health in childhood has been questioned (Ortega et al., 2008a). It seems that body composition, cardiovascular endurance, and muscular strength are stronger components of children's perception.

Coordination, physical activity, body fat and sports competence perception were also positively associated with objective measures of strength, endurance and general fitness. As it has been mentioned before, children with a greater practice of physical activity obtained a greater physical fitness and body composition (García-Artero et al., 2007; Isler et al., 2002; Ortega et al., 2008b; Rizzo et al., 2008), and consequently they feel more active and with less body fat. In addition, it seems that doing sport could improve coordination and sports competence, and consequently children's better self perception. In this line, previous studies also found a relation between physical activity, body fat, coordination and sports competence perceived with strength (Marsh, 1996) and endurance fitness (Carraro et al., 2010; Marsh, 1996).

However, no association between health and global self-esteem perceived and physical fitness measures was found. In PSDQ health is regarded as not getting sick often and getting well quickly when you are sick (Marsh, 1996). In this questionnaire children are asked to compare their health regarded as merely the absence of disease or infirmity and not the state of complete physical well-being, which seems to be related with health-related physical fitness. Previous research also found an association between any physical fitness measure and perceived health (Carraro et al., 2010; Guerin et al., 2004; Marsh, 1996) or global self-esteem (Guerin et al., 2004). However, Carraro et al. (2010) found a correlation with global self-esteem perceived with endurance, and Marsh (1996) BMI, strength and endurance measures. This disparity in self-esteem could be explained by the difference in participant´s age between the present and the previous studies. In addition, although in the present study self-esteem was not associated with any physical fitness variable, it was marginally associated with endurance measure.

Finally, several differences in physical self-concept measures were found between high and low physical fitness groups. High physical fitness group showed major values of physical self-concept, except for self-perceived health and appearance where no differences were found. In line with the previous correlation results, it seems that children with a real higher physical fitness perceived themselves physically better. In this line, Greenleaf et al. (2010) compared physical self-concept between 11-to-15-year-old children according Fitnessgram® references in healthy fitness zone and needs improve zone. These authors found that girls within endurance healthy fitness zone rated themselves with a greater self-esteem, strength, endurance and body satisfaction concept. Boys in the endurance healthy fitness zone showed greater strength, endurance, and body satisfaction. No differences were found in boys' self-esteem and flexibility self-concept in both boys and girls between fitness zones.

5. Conclusion

Physical self-concept and health-related physical fitness are positively associated in Spanish schoolchildren. There are large differences between boys and girls regarding physical self-concept and physical fitness. Boys really are and perceive themselves stronger, have greater endurance and general physical fitness than girls. Both, activity perceived and sports competence perceived in boys are also higher than in girls. In Spanish children there is an association between objective and self-perceived measures of body composition, flexibility, strength, endurance, and general fitness. In addition, high physical fitness children rate themselves physically greater than low physical fitness children. These findings highlight the connections between physical self-concept and health-related physical fitness and consequently the need for understanding the concept for better health-promotion strategies. Physical Education teachers should focus on improving their students' physical fitness in order to increase physical self-concept and consequently their whole development. Due to the gender differences found out in this study, teachers are recommended to apply individualized strategies to make their teaching more effective. For example, girls should perform additional tasks to improve their physical fitness, especially their muscular strength and cardiovascular endurance. Using teaching styles that individualize Physical Education will also be fundamental for both genders to work on an appropriate level of difficulty regarding their physical fitness.

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